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METHODOLOGY OF CREATING AND USING SOFTWARE TOOLS IN COMPUTER SCIENCE

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Abstract:

Pedagogical software tools, pedagogical technology, the concept of electronic textbooks, simulator programs, multimedia tools, methods of their creation and use, possibilities are considered in the article.

Keywords: CourseLab, iSpring Suite, AutoPlay Media Studio, eBook Maestro, Adobe Flash technology, electronic textbook, pedagogical software tool.

INTRODUCTION

One of the pressing challenges of the day is the need to equip educational institutions with new technological tools for the educational process. According to their unique physical traits, each person receives information differently, but visual information is unquestionably more impactful than aural information. With the aid of electronic learning materials, students can start participating actively in their education, regardless of the effect of other motivational elements. The development of active, effective means of education can be created through the creative competence of each teacher and the quality of the information used in it and the convenient and easy description of scientific information. Electronic learning resources can be used not only as information, but also to acquire new knowledge[1].

The term "pedagogical technology" refers to a group of scientifically supported educational and raising procedures that depend on the capacity of both the instructor and the student to think critically. There is no such thing as a permanent, uniform, or pre-planned procedure in educational technology. In other words, educational technology cannot be referred to as a fixed project that fits into a specific template. Due to the fact that each audience within a group may demand a unique educational method and its technology depending on factors such as education, scientific potential, age, gender, and other indications. [2].

The term "Pedagogical technology" has been defined in a variety of ways by scientists over the years. For example, V.P.Bespalko emphasizes that "Pedagogical technology is a project of the process of formation of the student's personality that can guarantee pedagogical success regardless of the teacher's skills," and V.M.Monakhov asserts that "Pedagogical technology is a system of orderly actions that lead to pre-planned results and must be carried out." I.Ya. Larner stated his opinion that "Pedagogical technology represents a defined goal that can be reliably realized through the results of teaching reflected in the actions of students," while M.V.Klarin stated that "Pedagogical technology is the design of the educational process based on predetermined goal indicators with a technological approach to the educational process."

A new generation of educational tools and new types of education are at the core of the integration of pedagogical and information technology into the educational process, making it crucial. In addition to the traditional teaching techniques employed in education today, computer-based educational methodical electronic items, including all multimedia systems regarded as educational aids, are hitting the market [3].

The quality of education in the public schools, academic lyceums, and higher education institutions should be dramatically improved at the same time, at the expense of the widespread introduction of modern information and communication and pedagogical technologies, electronic textbooks, and multimedia tools into the educational process. The educational and laboratory foundation of educational institutions will be outfitted with the most up-to-date educational and laboratory equipment. Special attention is given to strengthening with computer technology and developing an efficient system of material and moral stimulation of instructors' and trainers' hard work.

There are four basic teaching styles used in educational procedures. Shown in Figure 1.

1. Since the method of explanation and illustration does not presuppose the existence of feedback between the educational processes and the students, it can be introduced based on the use of the information and communication technology demonstration capabilities.

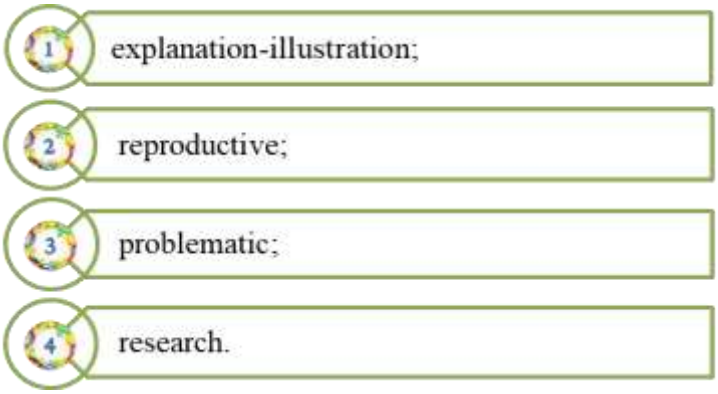

Figure 1. Four main methods of teaching

2. The assimilation of the knowledge provided by the teacher and (or) information and communication technologies to the student and the organization of the learner's activities related to the creation of the studied material and its use in similar (analogous) situations are the goals of the reproductive method of teaching using information and communication technologies.

3. The problem-based learning approach organizes the educational process as posing a problem and looking for ways to address it. This is done by using the capabilities of information and communication technology. The primary objective is to support the students in maximizing their cognitive activity.

4. The implementation of the research methodology in education using information and communication technologies is based on the independent creative activity of students engaged in the process of conducting scientific and technical research within the context of specific issues. With this approach, learning is structured around engaging in active investigation, discovery, and play. The outcome is typically more successful and effective than employing the procedures above[4].

Based on this, one of today's most pressing issues is the quality structure of the teaching process in general secondary schools and the use of contemporary information, communication, and pedagogical technologies to convey the subject. In typical secondary schools, it is highly challenging to get pupils interested in science and fully ensure that they have mastered it through the use of a basic lecture or by having them jot down information in a notebook while describing the lesson's main points. In order to increase student interest in science and foster friendly rivalry in the classroom, teachers should employ visual aids linked to the subject, computers, training programs, electronic whiteboards, projectors, and gaming programs during lessons.

The idea of pedagogical software tools is one that greatly aids us in conveying the subject's substance to students in general secondary school systems.

The educational process can be partially or completely automated with the aid of computer technology using pedagogical software tools. They are used as teaching materials for contemporary technology and are regarded as one of the promising ways to improve the effectiveness of the educational process [5]. A software product (collection of programs) intended to achieve certain didactic goals in a subject, technical and methodical support, and supplementary auxiliary tools are all examples of pedagogical software tools.

Pedagogical software tools can be divided into:

- educational programs, based on the level of knowledge and interests of students, are aimed at mastering new knowledge;
- test programs are used for the purposes of checking or evaluating acquired knowledge, skills and abilities;
- exercisers serve to repeat and strengthen previously mastered educational material;
- programs forming a virtual learning environment with the participation of the teacher (Virtual existence systems).

Pedagogical software tools created from subjects must meet the following methodological requirements:

1. Pedagogical software tools - construction based on the interdependence of conceptual, figurative and moving components of presentation of educational material.

2. Pedagogical software tools provide educational material in the form of a high-order structure. Consideration of interdisciplinarity.

3. Creation of opportunities to determine whether the learner has gradually mastered the educational material in pedagogical software tools based on the implementation of various controls[6].

In order to improve the quality of knowledge transfer and to enrich it with electronic manuals, it is necessary to determine the logical-structural form of the computer science teaching process, to adapt it to the needs of life, to create practical tasks, to prepare methodological recommendations and instructions based on them, and to create practical tasks.

Education is organized on a demonstration basis and is made more effective by software and practical instruments. We can name a few highly regarded products, such the iSpring Suite, CourseLab, and Adobe Flash programs, as examples of pedagogical software tools that offer the ability to develop multimedia e-learning courses.

You can develop e-textbooks, video lectures, e-control tests using QuizMaker, questionnaires, networked dialog e-courses, and online presentations utilizing the tools in the iSpring Suite (QuizMaker, iSpring Visuals, and iSpring DialogTrainer).

CourseLab is a user-friendly and adaptable software program made for producing interactive educational resources (electronic courses) for the Internet, distant learning systems, CD-ROMs, and other optional information storage.

Extensive usage of Adobe Flash technology and its enormous potential, which includes the creation of pedagogical software tools For the creation of animated projects based on vector graphics that offer internal interactivity, Adobe Flash technology is a potent, simple-to-use tool.

The multimedia electronic study guide we developed for seventh-graders on the topic of "Informatics and Information Technologies" aims to give students the opportunity to work effectively, teach and educate them, practical methods of solving educational and educational issues, and information-represents a whole process carried out through communication technologies. Its core objective is to impart to the next generation the experience, information, skills, and abilities that an individual has gathered. To this end, its mission, content, methods, and organizational structures are all manifested.

Our program was divided into sections labeled "Topics," "Conditional marks," "Evaluation of knowledge," and "Creators."

Launch the software and select "Start" from the home page to advance to the following page when using it.

Figure 2. The main window of the multimedia electronic tutorial program for the subject "Informatics and Information Technologies".

The topical order, or table of contents, is displayed on the following page. All of the subjects covered in the textbook are mentioned sequentially in the topics section. It offers details about the subjects.

Figure 3. Topics section

Based on the provided content, students choose themes and are then given knowledge on those topics. Text, audio, image, and other formats are used to deliver the information.

Symbols for practical tasks, including text-based chores, speech information, and etc, are included in the section on conditional symbols.

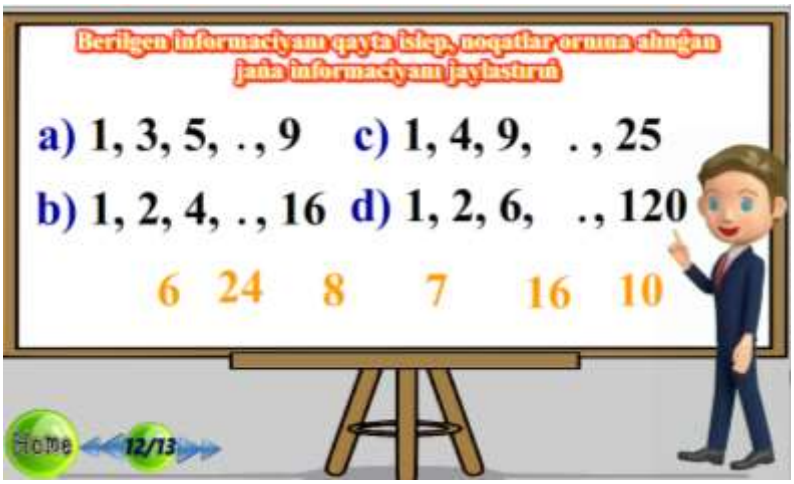

Figure 4. Practical tasks window in the knowledge assessment section

Students work through a variety of didactic tasks in the knowledge evaluation department to reinforce the content they have learned through traditional and technological means utilizing diverse techniques. Exercises are provided in a variety of formats; this aids in both subject mastery and successful education.

They can learn about the software product and the creators from the section called Creators.

CONCLUSION

In conclusion, the use of diverse software tools in the development of pedagogical software gives a variety of opportunities in the production of interactive exercises, and such pedagogical software products can enhance the interest and significance of students' learning.

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